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**At the end of the show I'll give you a discount code to use on the Cool Cat Teacher Store. You can use today's technique with just about any type of thing where you're trying to get kids to pay attention to details. Today we talk to Dan Meyer about helping kids who hate math be able to learn it and maybe even enjoy it. This is episode 69.**

*The Ten-minute Teacher podcast with Vicki Davis. Every week day you'll learn powerful practical ways to be a more remarkable teacher today.*

VICKI: How can we help kids love math who just hate it. Today we have Dr. Dan Meyer [@ddmeyer](https://twitter.com/ddmeyer) with us and we're going to talk about how we can help those kids who really hate math love it. So how do we start, Dan?

DAN: Yeah, we make these huge promises to students about math's power in the world but then we give them these flat problems on paper that only ask for either remember some formula and calculations which lacks the vibrancy of the world and reflects none of the work that people who actually love math actually do. So my project 3 Act Math invites students using modern technology and multimedia to do the work of people who love math and it brings the world into the classroom and all of it's full colored glory.

**Dan Meyer's Google Doc full of 3 Act lesson plans:**

[https://docs.google.com/spreadsheets/d/1jXSt\\_CoDzyDFeJimZxnHgwOVsWkTQ\\_EsfqouLWNNC6Z4/edit#gid=0](https://docs.google.com/spreadsheets/d/1jXSt_CoDzyDFeJimZxnHgwOVsWkTQ_EsfqouLWNNC6Z4/edit#gid=0) )

VICKI: So we will link to a previous episode, Felicia Casto and her amazing elementary math classroom <http://www.coolcatteacher.com/felicia-castos-exceptional-elementary-math-classroom/> who just raved and raved about the transformation power about 3 Act math lessons. So take us through what are 3 Act math lessons?

DAN: Well, the thing is if you taught for any amount of time at all you're so used to the structure and format of word problems, it seems like the way the world actually works, there's no other way. But then what I've been doing, ever since I got a projector in my classroom years ago was to bring in multimedia pictures and videos and use those with no information attached, no numbers, no question even, and then to slowly build up the problem with students.

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My conviction is the best most interesting math problems aren't assigned on paper but co-constructed with teachers and students in conversations. So for instance, I got a video of this water tank, shaped like a hexagonal prism, a geometric shape and it's filling up kind of slowly and there's no numbers on the screen yet, there's no question. And I just asked students what are you wondering. And we talked about our questions for a second and then I offered them – what my question is, like how long will I take to fill up?

(See “leaky faucet” lesson plan - <http://threeacts.mrmeyer.com/leakyfaucet/> )

I asked them for their estimate, a very few math problems in text books ask students to just guess, I even ask students for wrong answers which is unheard of in textbook math. Like, what’s an amount of time you know is way too long or too short? Like it definitely won’t fill up by that time. And then I asked them what info seems necessary here. All these questions that people who do math on the world they ask themselves these questions but they’re almost entirely absent from textbook mathematic. That’s the interesting work of 3 Act Math. And those 3 acts are like – act 1 is setting the stage, like in a story you’re setting a stage.

Act two is when the hero encounters obstacles and conflicts in our case, picking up these mathematical tools to learn how to solve the problem. And act three, here’s the kicker, is that we show the answer – not in the back of the book but actually show motion this water tank filling up so the students see how close they got. And if you’ve never heard a group of students applauding at the end of a math problem just come into a 3 Act math class and the sense of suspense as the tank is filling up and am I correct? It’s palpable, and really fun.

VICKI: Felicia talked about in her classroom and it sounds like you’ve seen kids change their opinion. I know my husband wasn’t crazy about math but he’s an engineer now and he fell in love with math when he had to sell real world problems as he was building houses. He was like, cool, I can figure out how I’m going to construct this house. So what have you see with kids who hate math with this approach?

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DAN: Yes, with this approach what’s nice is that students – I mean there’s loads of reasons why students dislike math but one reason they don’t see its actual power in the world around them, they do all this work and they get an answer and the answer is what’s in the back of the book or it’s not. And that’s the sum total of resolution. But your husband’s use of math actually paid off in the sense of accomplishment of power. That’s the same approach I’m going for with this act 3 and these problems is showing the result of your math in the world. So that’s one aspect.

Another aspect is that students often at times if they struggle with math they feel such low status and it’s like in the classroom they are the stupid ones. They feel that way. What’s nice about just showing the water tank and asking for question is that the advance students who are moving fast don’t have an edge here. Anyone can have a question. And for the estimate, anyone can estimate correctly. Maybe the case that students are struggling with computation actually are better equipped to estimates answers than these students who are little robot calculators. So it levels the playing field in a really nice way for students who have historically hated math.

VICKI: So what do you think the biggest mistake teachers make with students who hate math?

DAN: One I can see a lot of is that if students struggle with computation, with remembering formulas and using them that teachers will just offer more and more examples or more and more practice of the very same when really what we need to do is question how we're defining math, why math is defined so narrowly is being quick at memorized calculations and why math doesn't reflect the work of your husband and other mathematics do like asking questions, asking for estimates, asking for wrong answers, thinking about info that's necessary, discussion and debate. These are all verbs and work that people do who love math and it's often at times absent from our classes.

VICKI: So Dan when you have a teacher who've been using the worksheets, they've been using the next book and the same test that they've had for the last ten years, let's say. How can they start moving into 3 act math? They're nervous, they know they already get results doing it, they call it old-fashioned way. But they also know they have some students they're not reaching. How can they start?

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DAN: Right. I totally buy it, it's a big shift, it really is to a different kind of pedagogy. And so what I recommend people do is start with just estimation. They're very easy questions to ask, they're really interesting to students and it requires very little investment of time which is of course the most precious commodity in the classroom. So there's a website that I like a lot called [estimation180.com](http://estimation180.com) and it's just where a teacher named Andrew Stadel @[mr\\_stadel](https://twitter.com/mr_stadel) who's now a coach just gathers a bunch of imagery that provokes estimation question, how many, how long, how high? Those kinds of questions.

And the argument is to take five days this week, this coming week, and every day just ask your student at the start of class to look at an image, ask them for a number they know is too high, too low and just right. And encourage them overtime to be more brave with their too high and too low answers is the wrong answers and then just show them the answer at the end. And you do that and get used to how interesting it is for students. And I promise you that the next day when you don't do this estimation task they're going to ask you, "That was different, interesting and fun, why are we not doing that?" And let that be your route into other kids of mathematical works like asking some questions and 3 act math.

VICKI: So, Dan, would you give math teaches a pep talk. You know, they're right in the middle of standardized testing, it's the end of the year, it's kind of overwhelming.

DAN: Yeah, I know, this is definitely an exhausting time of the year. But the good news is that after standardized testing is done you're basically in your lab time, your "try something new out" time and "see if it works" time. So I just encourage folks,

like, let that be the time where you - don't just kind of sag into summer but try something new and interesting out and see how students react to it. Let that set you out for some resolutions for the fall or the new school year.

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So for instance, estimation190 or 3 act math. All of those can be interesting things just to try out and experiment with.

VICKI: Teachers, I will give you the link to the Google spreadsheet that has so many amazing 3 act math problems. Dan is a wealth of resources for math teachers and you know, math should be exciting. And we don't want our students to hate math. It breaks my heart when I see kids who just don't like math or think they're dumb. Because math is really something that we all need. I mean, we all need to balance our checkbook. So get out there and really go after those kids who don't like math and let's try to turn them around.

Check out my store at [store.coolcatteacher.com](http://store.coolcatteacher.com). If you use the code, REMARKABLE, you can get a 20% discount on my productivity books and forms, substitute teacher manual, lesson plans, video tutorials and all the things that I have on there. Or you can always check out my store on Teachers Pay Teachers.

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